

# PATENT ABSTRACTS OF JAPAN

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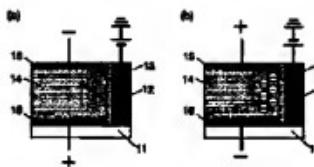
(22)Date of filing : 26.03.2002 (72)Inventor : YAHIRO MASAYUKI

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## (54) SIDE GATE TYPE ORGANIC FET AND ORGANIC EL

### (57)Abstract:

PROBLEM TO BE SOLVED: To provide an organic FET which can be used practically even if an organic semiconductor amorphous thin film of low mobility is employed, and to provide an organic EL element capable of having a large open area ratio and requiring no peripheral transistor.



SOLUTION: The side gate type organic FET is fabricated by standing a gate electrode 12 on a substrate 11 and forming a carrier moving layer 14 of an organic semiconductor on the same substrate. The carrier moving layer 14 touches the gate electrode 12 through an insulation film 13. A source electrode layer 15 and a drain electrode layer 16 are formed, respectively, above and below the carrier moving layer 14. Furthermore, two control electrodes are stood on the substrate and an organic semiconductor light emitting layer is formed on the same substrate to touch both control electrodes through the insulation layer. Injection electrode layers are formed above and below the light emitting layer. When voltages of different polarity are applied to both control electrodes, holes and carriers are recombined in the light emitting layer to emit light.

## DESCRIPTION OF DRAWINGS

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**[Brief Description of the Drawings]**

**[Drawing 1]**The sectional view showing the basic constitution of side gate type organicity FET concerning this invention.

**[Drawing 2]**The sectional view showing another example of composition of side gate type organicity FET concerning this invention.

**[Drawing 3]**The sectional view showing the example of 1 composition of the side gate type organic electroluminescence concerning this invention.

**[Drawing 4]**The sectional view showing another example of composition of the side gate type organic electroluminescence concerning this invention.

**[Drawing 5]**The sectional view showing the composition of conventional organic FET.

**[Drawing 6]**The sectional view showing the composition of the conventional organic electroluminescence.

**[Drawing 7]**The graph which shows the relation of the current density and light emitting luminance of organic electroluminescence.

**[Drawing 8]**The graph which shows the voltage of organic electroluminescence, and the relation of light emitting luminance.

**[Drawing 9]**The graph which shows the voltage of organic electroluminescence, and the relation of current density.

**[Drawing 10]**The circuit diagram of the organic electroluminescence drive circuit of an active matrix.

**[Description of Notations]**

11, 21 -- Substrate

12, 22 -- Gate electrode

13, 23 -- Insulator layer

14, 24 -- Career moving bed

15, 25 -- Upper electrode

16, 26 -- Lower electrode

31, 41 -- Substrate

32, 42 -- Control electrode

33, 43 -- Insulator layer

34 -- Organic electroluminescence luminous layer

44 -- Electron hole transporting bed

45 -- Electron transport layer (luminous layer)

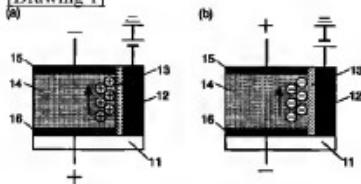
35, 36, 46, 47 -- Injection electrode

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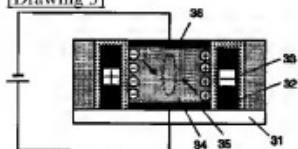
**DRAWINGS**

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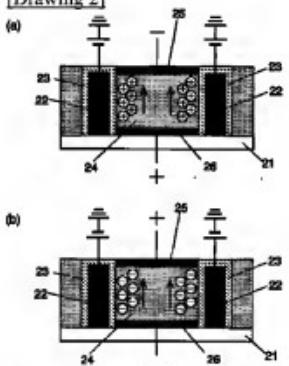
[Drawing 1]



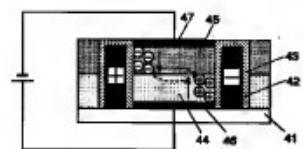
[Drawing 3]



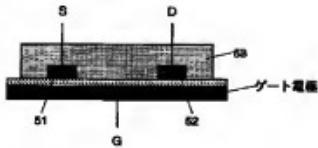
[Drawing 2]



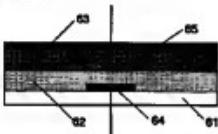
[Drawing 4]



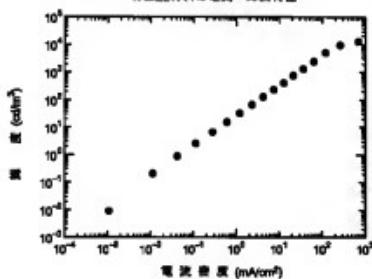
[Drawing 5]  
従来のPET



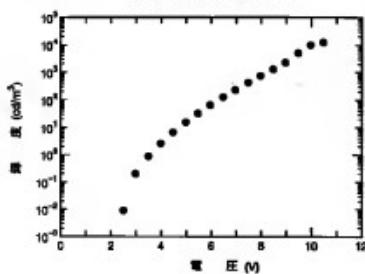
[Drawing 6]  
従来のEL



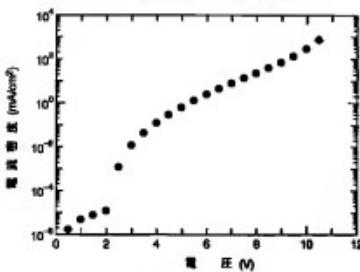
[Drawing 7] 有機EL材料の電流-輝度特性



[Drawing 8] 有機EL材料の電圧-輝度特性



[Drawing 9] 有機EL材料の電圧-電流特性



[Drawing 10] アクティブマトリクス方式の有機EL駆動回路

